

Providing Value-added Service to C&I Customers through PQ Audits

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We Are Lewis County PUD!

- Power you can rely on;
People you can trust!
 - Voted into being in 1936
 - Serves approximately 31,000 customers
 - Over 3,300 miles of distribution lines
 - Owns and operates the Cowlitz Falls Hydroelectric Project
 - Produces on average 261,000 MWh
 - 33% of the District's needs



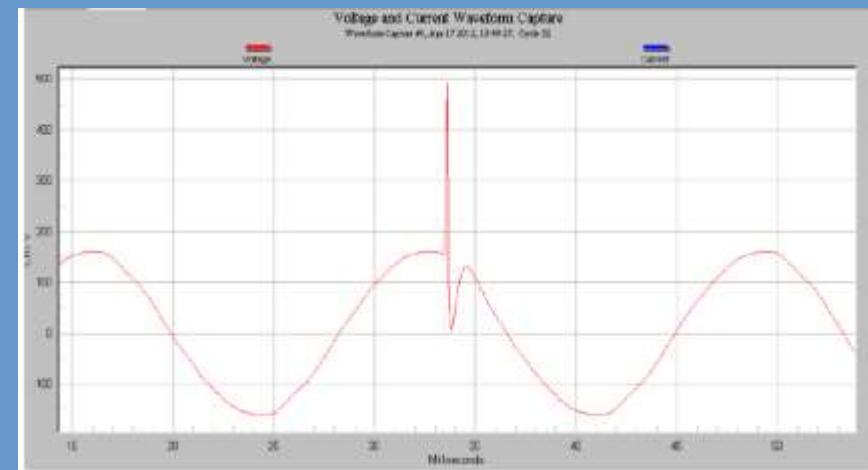
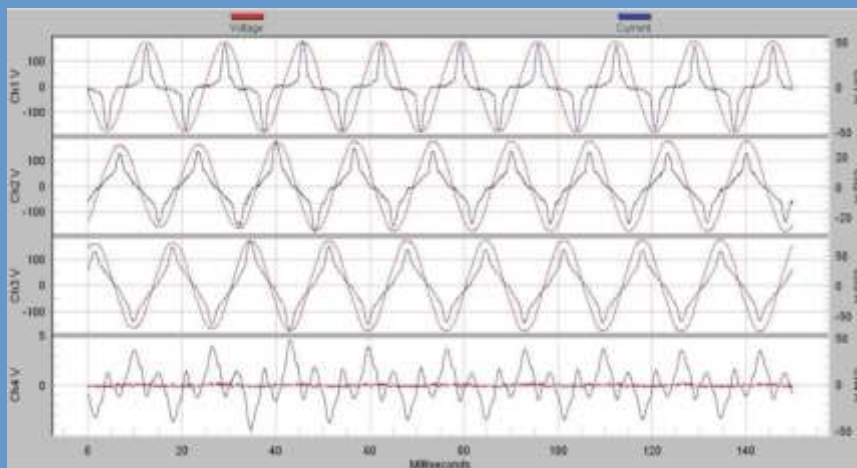
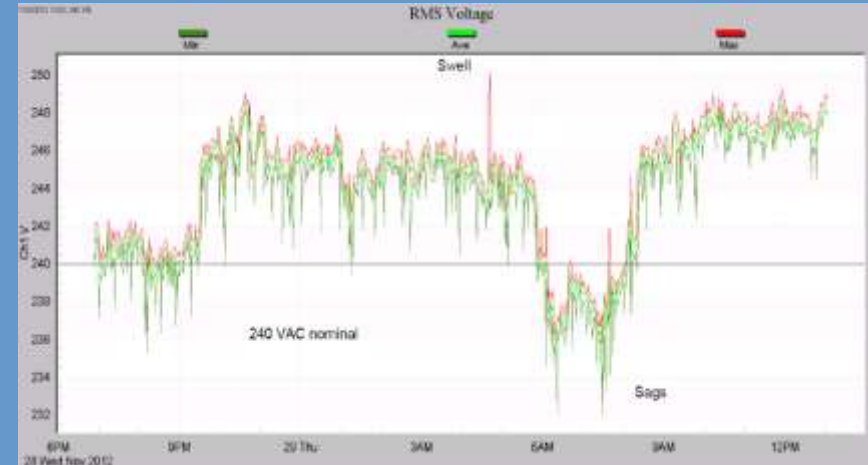
Strategic Plan



- First ever Strategic Plan completed in 2013
- Invest and Position for the Future
- Customer Focus
 - Deliver programs that provide value to customers
- We are the Community we serve!

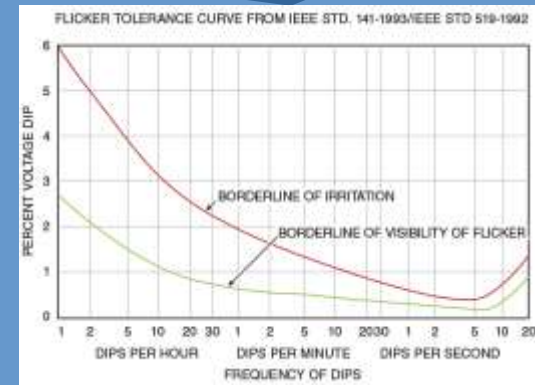
What is Power Quality (PQ)?

- Sag or undervoltage
- Swell or overvoltage
- Transient or Spike
- Noise
- Harmonic Distortion



Issues Caused by Power Quality

- Voltage Flicker (Sag/Swell)
 - GE Flicker/CBEMA curve
- Harmonics cause:
 - Tripped breakers, excessive heat, equipment mis-operations
- Poor Power Factor (PF)
 - Results in utility oversizing equipment, overheating, operational inefficiencies, etc.
 - Utility PF penalties = higher customer bills
 - Resolving this is a win-win for both parties



Power Quality Challenges



- Customers have non-linear equipment
 - X-ray machines, VFDs, power supplies, electronics, arc furnaces, etc.
 - Marketed through sales offers and energy efficiency programs
- Problems within facilities can occur!
- Many customers aren't informed of PQ mitigation needs
 - Line reactors, filter networks, equipment commissioning, etc.

Our Customer Makeup



- 31,000 Customers
- Residential – 25,000
- Commercial – 6,000
- Industrial – 31
 - Range from 1 to 8 MW

PQ Audits

- Focus on C&I customers
 - Have more non-linear equipment than residential customers
 - Equipment causes issues to other customers on the circuit
 - Identify causes of poor PF
 - mitigation lowers utility bills
- Proactive approach to reaching out to customers
 - Identify all industrial customers and customers with low PF as targets

PQ Audit Tools

- Power Monitors, Inc.
 - Revolution
 - Eagle 120
- Fluke 88 VOM (multimeter)
- Fluke 337 Ammeter



Example – Rock Pit

- Rock Pit
 - 400 HP motor plus multiple smaller motors
 - Poor power factor
 - Customer had self-caused outage & questioned billing charges
- PQ Audit
 - Used PQ monitoring equipment to identify blown capacitors & high inrush current
 - Replaced capacitors and worked with manufacturer to optimize soft-start motor controller
 - Saved approximately \$12,000 per year

Example – Dentist Office



- Customer complained of “strange things” happening in the office
 - Already replaced computer servers
 - Heat pump components failed & replaced
 - GFCI outlet trips
 - not related to PQ issues, but caused confusion
- PQ Audit
 - Monitoring equipment identified oscillatory transients & high total harmonic distortion
 - Helped narrow down potential causes to 6 X-Ray machines (still under investigation)

Why Provide PQ Audits?



- Build relationships with our customers
- Provide value-added service
- Filling a gap
 - Few companies offer this service regionally (none locally)
- Be the trusted energy advisor
- System and facility improvements are beneficial to all parties
 - Utility, customer, & other customers on the circuit

Final Thoughts



“Customer Service is not a department. It is an attitude!”